

**EFFECTS OF POPULATION GROWTH PATTERNS ON MANAGEMENT OF
SEWERAGE FACILITIES IN ELDORET TOWN IN UASIN GISHU COUNTY,
KENYA**

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DECLARATION

Declaration by the student

This project is my original work and has not been presented in any other university or College for examination purpose or any other award.

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DEDICATION

This research study is dedicated to my beloved parents late Paul Kerich and Selly Jesang who has always been there for me all through. My Hubby Christopher who believe that “tough times do not last but tough people do” it is also dedicated to, our children Collins, Charles, Sharon and Sandra who are all in school.

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LIST OF ABBREVIATIONS AND ACRONYMS

WMP	Wastewater Management Projects
GTZ	German Agency for Technical Cooperation
KNBS	Kenya National Bureau of Statistics
ELDOWAS	Eldoret Water and Sanitation Company
WHO	World Health Organization
DWM	Decentralized Wastewater Management
WWF	Waste Water Facility
PEDA	Population-Environment Development-Agriculture
SPSS	Statistical Package for Social Scientists
PSC	Post Secondary Certificate
Dept.	Department
HR	Human Resource
NEMA	National Environmental Management Authority

ABSTRACT

Population growth has been attributed to several factors including improved health facilities, social institutions and infrastructure. However, population increase may be due to migration from one region another, as experienced in urban centers. Eldoret town has had an increased population over the recent past, irrespective of the challenges facing its infrastructure. The sewerage services in Eldoret town are an important and are provided by Eldoret Water and Sanitation Ltd. The company has the responsibility of offering both sewerage and water services to the residents of Eldoret Central Business District and estates. The objectives of this study were to examine the effects of population growth patterns on managerial planning at the sewer plants; to identify the effects of population growth pattern on organizing for quality of service at the sewer plants; to establish the effect of population growth patterns on managerial staffing at the sewer plants and; to examine the managerial evaluation process of the sewer services and systems so as to plan and implement necessary changes that accommodates the changes in population growth patterns in Eldoret Town. Currently, the population using the sewerage services as per Eldoret Water and Sanitation Services is about 40,917. The staff of Eldoret Water and Sanitation Ltd comprise of 216 people who formed the target population for this study that sought to establish the effects of population growth on the management of sewer plants in Kenya. The study designed the research objectives and questions in a manner to help establish the effects. Literature was reviewed to establish facts as they are or have been in other countries. The Boserup's theory of population growth was adopted for the study and modifications were made. As such, a conceptual framework was designed to guide this study. The research design that was be adopted for this study was descriptive research design as it tried to describe the situation as it is and propose solutions to the managerial problem. Mugenda and Mugenda's formula was used to arrive at a sample size of 65 respondents. The study used both purposive and non-purposive sampling techniques to identify respondents. Questionnaires and interviews were the primary tools for data collection. Pilot testing was carried out to check for reliability and validity of the tools. Ethical considerations were equally observed where confidentiality of respondents will be secured. Data was presented and analyzed both qualitatively and quantitatively. It was established that population growth patterns have affected the approach to managerial planning, staffing, organizing and evaluation all in a bid to achieve quality of service. It was also established that population growth has exerted pressure on the organization's resources and as such there are fewer employees compared to the amount of work and that employees were mostly assigned jobs that did not match their skills. Consequently, the study makes recommendations that Eldoret Water and Sanitation Ltd should hire adequate and qualified and skilled staff to attend to its technical needs, carry out surveys and evaluate the work done by is employees to achieve quality of service. The study suggests that more research be conducted to assess the impact of population growth on evaluation on employee performance for quality as well the impact of population growth on the management of public assets.

CHAPTER ONE INTRODUCTION

1.1 Introduction

This chapter presented the background information, statement of the problem, purpose of the study, research objectives and questions, significance of the study, assumptions of the study, limitations and delimitations of the study.

1.2 Background of the study

Human population rates have skyrocketed within the past two centuries and closely correlate to economic growth and technological advancements hence affecting use of basic resources such as wastewater infrastructural facilities especially in urban centers, where population growth has been at its peak. The past demographic transition of the 1800's can be seen in many of today's developing countries, however, population stabilization is occurring at a much slower rate (University of Michigan, 2000). There has been much concern on the implied socio and environmental impacts of these population growth rates and their entailed production of wastewater. As such, the managerial process of the sewer services and systems so as to plan and implement necessary changes that accommodates the changes in population growth patterns has been a major challenge for most governments and related agencies for a long period of time.

According to WPDS (2011), Haub (2012) and UNDP Report (2013), the global population has been growing exponentially with the current rate standing at about 83 million annually with the current population estimated to be about 7.2 billion, up from slightly over 6 billion in 1999 and double the population in 1967. Baldwin (2011) argues that in as much as the annual global population growth rate has slowed down to 1.2% down from 2.1%, factors such as improved healthcare, technology and food production mechanisms still act as propellers for population growth while poor management of resources such as health and wastewater systems pose a reverse threat to the above. WPDS(2011) estimate that by 2040, the global population will be at 9 billion, given the current technological changes in the agricultural and medical sectors coupled with the social awareness on the impact of having large families in these stringent economic times. The UNDP Report (2013) states that Africa alone houses about 15.3% (1.1 billion)

of the total world population while Kenya, as at 2012, housed about 44 million people up from 39.8 million in 2009 and 8.9 million at independence.

In industrialized countries such as Europe, Russia, North America, Australia, New Zealand and Japan, demographic transition has been characterized by a steady change since the 1700s where the death rate began a long gradual decline while the birth rate increased (Didymus, 2013). The decline in the death rates was initially due to three factors namely trade revolution which introduced new foods such as potato and maize (corn) from the Americas; agricultural revolution that brought about higher yields of food production locally through the use of new agricultural practices and; the industrial revolution that made new goods available (Haub, 2012 and WPDS, 2011). All of these changes were gradual, and increased the general standard of living for the population, without major medical breakthroughs. Similar trends were observed in Africa, much of it attributed to the agricultural revolution that has given rise to a population “outburst” in the 20th century (Didymus, 2013 and UNDP, 2013); and still, with the technological advancement and improved healthcare services, it is expected that Africa’s population will quadruple by the end of the 21st century, to about 4.4 billion. On the other hand, the UNDP Report (2013) estimates that Kenya’s population will be standing at 52 million in 2040. This growth in Kenya is expected to exert more pressure on the existing infrastructure which is old and overwhelmed by the demands of the ever increasing population (Wilmoth, 2010). While the government of Kenya, in the recent past, has been seen to lay more emphasis on the improvement of infrastructural facilities especially in the urban centers (probably due to the fact that rates of population growth are peak in urban centers and cities in Kenya), development of the said infrastructure has been skewed towards medical and transport facilities (Wilmoth, 2010); leaving other sectors marginally unattended hence posing a great risk to the survival of the citizens.

The disorganized expansion of urban spaces in Kenya has limited the ability of national and local governments to provide urban security and to supply a basic social infrastructure in areas such as health, education, water, and sewage disposal facilities (IFRA, 2011). As a result slums are emerging, overcoming and swallowing what little crumbling infrastructure that already exists. Many urban dwellers do not have access to

electricity or potable water. Wastewater disposal has presented a tremendous health hazard; and indoor air pollution and poor nutrition all pose further threats (UN-Habitat, 2009). Many slums also flood routinely, sewage bursts and leaks and are vulnerable to accidental or malicious fires (Muraguri, 2011 and Owuor, 2011).

Managerial planning for sewerage facilities has been an issue of concern to governments, especially the Kenyan Government, as it affects the environments within which its citizens inhabit (Ralf, 2011). According to Johnson (2012), to achieve quality of service and efficiency in managing public facilities such as sewer plants, planning should ideally take three facets namely: Strategic – long term planning that encompasses the objectives, mission and vision of an organization. It is at this level of planning that considerations such as population growth patterns and ability of the existing infrastructure’s ability to handle the projected growth in population are taken into account hence affecting strategies for resource mobilization and expansion plans for the same infrastructure; Tactical – short term planning that emphasizes the current operations of various parts of the organization and; Operational planning which is the process of linking strategic goals and objectives to tactical goals and objectives. The latter describes milestones, conditions for success and explains how, or what portion of, a strategic plan will be put into operation during a given operational period. Johnson (2012) and Mittenthal (2002) argue that strategic planning entails articulation of specific goals and description of the action steps and resources needed to accomplish or achieve them. As a rule, most strategic plans should be reviewed and revamped every three to five years. Mittenthal (2002) also argues that operational planning includes a coordinated set of tasks for carrying out the goals delineated in a strategic plan. It thus goes into greater detail than the strategic plan from which it is derived, spelling out time frames and the roles of individual staff and management members, for example, in an organization. It also has a shorter horizon than a strategic plan — usually one fiscal year or 6 months.

On the other hand, it is argued that achievement of the managerial plans at whatever level should be accompanied by proper staffing strategies and policies (Heneman and Judge, 2006). Staffing is a critical organizational function concerned with the acquisition, deployment, and retention of the organization’s workforce (Ployhart, Schneider &

Schmitt, 2006). Lyon (2006) argues that staffing in the organization should consider the quantity and quality of staff for a given task as specified in the tactical and operational plan. Lyon further opines that to achieve this, managers should develop a staffing model and framework which entails legal compliance, adequate measurements and job analysis and rewards as support staffing activities and recruitment, selection and employment as core activities in staffing. Management of organizations, similarly, should also consider quality of staff viz a viz expected quality of work, ethical and organizational values and create a balance between the two (Lyon, 2006). Management of sewer facilities similarly and ideally should consider staff who would offer quality services to their clients, whose size is ever growing (GTZ, 2010). Countries such as USA, UK and most notably Vietnam, whose population has been on a slow but steady growth rate, have adopted several wastewater management staffing policies and frameworks such as the “*Wastewater and Solid Waste Management*” policy for their urban centers. The main purpose of WMP staffing policies is to develop enhanced wastewater management in areas where it is the sole responsibility of the government to provide wastewater disposal services.

According to World Bank (2011), monitoring is defined as a continuing function that uses systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing project or intervention with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds and; evaluation is the determination of the worth or significance of a development activity, policy or program to determine the relevance of objectives, the efficacy of design and implementation, the efficiency or resource use, and the sustainability of results. Evaluation on the other is a systematic collection and analysis of data in order to assess the strengths and weaknesses of programs, policies, and organizations to improve their effectiveness (NorAD, 2011). Monitoring and evaluation can be conducted using a wide array of tools, methods and approaches. These include, for example: performance monitoring indicators; the logical framework; theory-based evaluation; formal surveys such as service delivery surveys, citizen report cards, living standards measurement surveys (LSMS) and Core Welfare Indicators Questionnaires (CWIQ); rapid appraisal methods such as key informant interviews, focus group discussions and facilitated

brainstorming by staff and officials; participatory methods such as participatory M&E; public expenditure tracking surveys; rigorous impact evaluation; and cost-benefit and cost-effectiveness analysis. While monitoring and evaluating the efficacy of the services provided by sewer plants, population growth patterns in urban centers should form part of the process as they greatly impact the objectives and vision set at both the strategic and tactical planning levels (Ployhart, Schneider & Schmitt, 2006).

Kenya generates a lot of wastewater from industries, households, etc. Local wastewater and urban environmental companies need more capacity and independence to provide services and operate economically. Moreover, these wastewater enterprises call for more knowledge and support for operation, maintenances and financial management. At local levels, technical and management capacities are low-developed and in combination with the newly introduced and often “foreign” wastewater technologies, the local authorities are facing many problems (INWENT, 2009). In many cases, management of sewage sludge provided by urban environmental companies in Kenya is considered to be inadequate and incomplete. However, Githuku, (2009) notes that population increase has greatly contributed to the establishment of these companies and that their ability to handle the input capacity is severely strained. For instance, 50% of the wastewater generated in Nairobi ends up in the treatment facilities while the rest is used for cultivation of over 720ha using raw sewage (Githuku, 2009). One of the key causative factors in the strain of waste-water plants is population growth. KNBS (2010) indicates that there was an overall growth in the population by about 10%. Similarly, KNBS (2010) notes a rural-urban migration at a higher rate in the past 10 years, probably contributing more to the strain on these public resources. This calls for more advanced means of managing waste water plants.

In Eldoret town, similar observations as those by KNBS have been seen. There has been a very high influx of people into the town (ELDOWAS, 2001) leading to a strain on the waste water treatment plant. It is against this backdrop that this study seeks to address the management issues that are supposedly meant to mitigate the effect of population growth patterns. This study also will address the various aspects of managerial planning, staffing and evaluating for the provision of quality of service to its clients.

1.3 Statement of the problem

Over the recent past, there has been a rapid population increase which has resulted in a strain on the available public resources in local governments. One of these resources is the sewer system which is going through major strains in terms of capacity handling. New connections, both legal and illegal, have rendered the current systems incapable of handling the input capacity and hence posed a challenge on the management of these key public assets. Similarly, this has occasioned the frequent bursts and overflows of sewer manholes in towns and residential estates posing a great health risk to the residents. Management of the sewer systems in the local governments is equally under pressure to provide new solutions to the pending problems and dangers that face the residents. While it is apparent that with a population increase more revenue is collected by these local governments, a managerial problem within the local governments still hinders the finding and implementation of a strategy that will adequately handle the ever increasing population's basic facilities' needs.

1.4 Purpose of the study

The purpose of this study was to establish the effects of population growth patterns on the management of sewerage services in Eldoret town in Uasin Gishu County. Specifically, the study established the specific managerial problems that have hindered adequate and proportional development of the sewage systems to the relative increase in the population in Eldoret town.

1.5 Objectives of the study

The objectives of the study were:

1. To examine the effects of population growth patterns on managerial planning at the sewer plants in Eldoret Town
2. To identify the effects of population growth pattern on organizing for quality of service at the sewer plants in Eldoret town
3. To establish the effect of population growth patterns on managerial staffing at the sewer plants in Eldoret Town
4. To examine the effects of population growth patterns on the managerial evaluation process at the sewer plants in Eldoret Town.

1.6 Research questions

The following were the research questions for this study.

1. What are the effects of population growth patterns on managerial planning at the sewer plants in Eldoret Town?
2. What are the effects of population growth pattern on organizing for quality of service at the sewer plants in Eldoret town?
3. How has population growth patterns affected managerial staffing at the sewer plants in Eldoret Town?
4. What are the effects of population growth patterns on the managerial evaluation process at the sewer plants in Eldoret Town?

1.7 Significance of the study

This study is significant as it exposed the factors that have over time strained the sewerage system in Eldoret town and as such, highlight the challenges the management of ELDOWAS is going through. The findings of the study also expose the level of quality of service, planning and staffing process and the managerial evaluation of the sewerage projects of ELDOWAS for relevant adjustments. As such, the study will inform the major stakeholders of sewerage projects of the relevant areas that need adjustments and input so as to accommodate the changes in the population size.

1.8 Assumptions of the study

The study assumed that population growth has led to strains in the existing sewerage infrastructure. The study also assumed that managers of the sewer plants serving Eldoret town face managerial challenges as a result of the population growth patterns in the town. Finally, the study assumed that the challenges faced by ELDOWAS managers and heads of department were unaware of the challenge that population growth has had on their managerial styles and approaches and as such this study has brought to their attention.

1.9 Limitations of the study

The researcher encountered several limitations during the study period. Little local literature that was skewed towards treatment of wastewater was the major limitation. To counter this, literature from developed countries was reviewed and internal management briefs were also reviewed for the researcher to get actual picture of the situation on the ground. Likewise, the study period was also limited in that the time allocated for data

collection and analysis was not sufficient. More research assistants than those specified were hired for faster data collection and coding. The researcher also faced financial limitations and as such, had to solicit funds elsewhere so as to complete the research on time.

1.10 Delimitations of the Study

The study delimited itself to Eldoret towns and what the local authority of Eldoret regard as the estates within its boundaries. It also delimited itself to six estates that according to ELDOWAS have the highest number of sewer line connections and the CBD of Eldoret town. The study delimited itself to the effects of population growth on the management of sewer plants. Other factors such as the causes of population growth were being ignored.

1.11 Definition of Significant Terms

Significant term	Definition
Sewer Plant	A place where human waste is collected for detoxification
Population growth	A change in the number of people residing in a particular region, where in this study, Eldoret town
Management	The planning, coordinating, staffing, organizing, directing and evaluation process of work, projects or facilities for better operation
Management of sewerage	Proper wastewater collection and treatment
Wastewater	Water used to drain human waste or any other form of waste
Treatment	The detoxification process of human waste at the sewer plant

CHAPTER TWO LITERATURE REVIEW

2.1 Introduction

This chapter looked at the effects of population growth on the economic planning, organizing and staffing in organizations for management of public assets. It also critically analyzed theory of population growth as postulated by Ester Boserup. Finally, a conceptual framework for the study was developed and a knowledge gap identified.

2.2 Effects of population growth on managerial planning at the sewer plants in Eldoret Town

Good asset management makes an essential contribution to the governance and management of a public entity's business and is an integral part of an organization's wider service and financial planning process. Walker (2010) argues that asset management has to be recognized for what it is – an essential part of effective planning – particularly for organizations whose services rely on assets to support their service delivery. It links together an organization's objectives with the levels of service needed to deliver them, the work required on the assets to sustain those levels of service, and the finances needed to support that work. Emma and Alan (2009) state that managerial planning takes three facets namely strategic, which is long term planning, tactical, which is short term planning that emphasizes the current operations of various parts of the organization and operational planning which is the process of linking strategic goals and objectives to tactical goals and objectives. The latter describes milestones, conditions for success and explains how, or what portion of, a strategic plan will be put into operation during a given operational period (Johnson, 2012). Managerial planning for the sewer services in urban centers similarly takes the three planning dimensions as mentioned and discussed below.

2.2.1 Effects of population growth on managerial strategic planning at the sewer plants in Eldoret Town

According to Johnson (2012) and Mittenhal (2002), strategic planning entails articulation of specific goals and description of the action steps and resources needed to accomplish or achieve them. As a rule, most strategic plans should be reviewed and revamped every three to five years. Strategic planning involves determining the missions

and objectives of an organization, choosing future courses of action from the available alternatives and the development of effective steps to achieve those objectives (Emma and Alan, 2009). House et al (1993) argues that population growth has over time increased the poverty index of countries besides impacting strategic planning where managers are required to make long term plans for resources through mobilization and sourcing of funds. According to Maggie and Menachem, (2007) and Scheffer (2004), resources such as land which are limited are exponentially strained by population growth, implying that planning is imperative. Maggie and Menachem (2007) argue that global figures that describe the lack of water and sanitation services are alarming. More than 1.1 billion people do not have access to improved drinking water supplies. Lack of sanitation is an even larger problem; an estimated 2.6 billion individuals live without improved services. “Improved access” to water and sanitation may, but does not necessarily, represent access to water or sanitation services that meet international engineering and health standards, such as those set forth by World Health Organization (WHO). Sources that meet the definition of improved water include a household connection, borehole, protected dug well, protected spring, or rainwater collection. Connection to a public sewer or septic system or use of ventilated pit latrines and some simple pit latrines qualify as improved sanitation.

In the UK and USA, Steven et al (2000) noted that the development of urban wastewater management strategies and technologies from the early nineteenth century to the present exhibited a cyclical tendency. During the middle of the nineteenth century, the centralized water-carriage sewer system replaced the ailing decentralized privy vault-cesspool system. From the end of the nineteenth century to the present day, centralized management has remained the preferred urban wastewater management method, although the implemented technology has changed. During the past few decades, however, renewed interest in previously discarded decentralized management alternatives has been spurred by urban development patterns that have changed wastewater services needs, and as such, has impacted strategic planning in organizations that offer these services. Managers of agencies providing wastewater handling services are compelled to carefully make strategic plans that are inclusive of newer technologies and dynamic plans that accommodate changes in personnel in the work place. These plans may put into

considerations changes expected to occur in the population among others in a period of over 50 years, as was the case when the centralized system was being designed. Currently, the sewerage infrastructure in the UK, USA and other developed countries is receiving new connections or clients at a very high rate but the major changes have been recently directed towards treatment of sludge and not expansion. This is because the sewer lines that were laid over 30 years ago were designed to accommodate changes that would occur many years to come. However, the approaches to treatment of the waste water keep on changing as the chemical composition of the wastewater changes. It is this area that is constantly being researched on and how to reduce the toxicity of the water.

In Africa, countries such as South Africa similarly experienced earlier development in the wastewater management and treatment systems. Due to the prolonged colonial period and stay of the Whites, most of who were in key administrative positions in the country, most infrastructure at the time of independence was already developed. However, most residents in major urban centers in South Africa lived in townships and as such, provision of such requirements was easy. Wastewater treatment and management in South Africa is equally advanced. Most townships, just like in other countries studied above, have the centralized system with a few exceptions of the large farms owned by the Whites where each farm develops its own cesspool. The strategic planning at the agency level adopted strategic measures by factoring future growth in the number of clients using the services. Modern technologies of channeling the wastewater were adopted long ago before independence and still serve the population in townships adequately. Other countries such as Zambia and Zimbabwe face administrative challenges in that the population changes have in the recent past out-weighed the existing wastewater handling infrastructure. More people have been found to migrate the urban centers hence piling more pressure on the existing infrastructure. Although the respective governments have been receiving aid from donors and other stakeholders, the trend has been changing in the recent past due to inflation in the minority countries where most of this aid comes from. As such, adoption of newer and efficient technologies is on the slow since these technologies require a substantial investment in terms of infrastructure, personnel and research.

In Kenya, the National Environmental Management Authority (NEMA) in conjunction with other stakeholders and donor countries have similarly engaged in research and enforcement of new procedures that protect the environment against degradation as a result of either effluent discharge from residents or inadequate treatment from the treatment plants. NEMA similarly has also taken steps to ensure that agencies such as ELDOWAS among others in Kenya have adequate and effective operations plans in terms of facilities, policy, personnel among others. However, the personnel aspect of planning for has been a challenge to the local wastewater treatment agencies since there are few qualified people in the field of wastewater treatment and the budgetary allocation for the recurrent wage bills such as salary, which has a direct impact on the personnel, is limited. As such, these agencies, ELDOWAS included face challenges in recruiting qualified staff due to lack of skilled personnel and lack of adequate finances. It is expected that the managers of such agencies will put more strategic measures in ensuring that there is enough revenue collection and efficient use of the collected revenues whilst ensuring that the services offered are extended to other people who currently do not have access to the services.

Strategic planning at ELDOWAS entails setting of client charge rates that would be applicable for the entire period which the strategic plan applies, making long term decisions that involve expansion of the sewer plants and other major infrastructural changes and projected staffing needs for the strategic planning period among other decisions based on the population growth rates and patterns (ELDOWAS, 2009).

2.2.2 Effects of population growth on managerial tactical planning at the sewer plants in Eldoret Town

A commitment of resources is a pre-requisite for the development of a successful plan. Economists acknowledge that population growth has impaired the productivity of renewable natural resources and their provision of environmental services. *Renewable* resources are those such as fresh water from rainfall, soil, and fisheries that can be harvested and used up to certain thresholds without impairing their long-term viability. *Environmental services* may include the pest control provided by species rich ecosystems, mineral nutrient absorption and cycling in healthy soils, water catchment,

treatment and filtration, and flood prevention (House et al, 1993). Forces associated with population growth are most threatening to the environmental products and services that renewable natural resources provide when property rights are hard to assign or maintain. By contrast, most economists find the economic impacts of population growth on *nonrenewable* natural resources, likely to be less strong than once assumed.

According to House et al (1993), technological change increasingly has been seen as the driver of both population and economic growth, and as urban industrialization distanced most economic activity from the land, theorists of economic growth lost interest in natural resources. With a focus only on capital, labor, and technology, and with constant rates of population growth, savings, and technological change, the models yielded steady-state growth paths in which output expanded indefinitely along with capital and labor. More elaborate formulations distinguished among different sectors of the economy (Maggie and Menachem, 2007). While the actual role of population and resources in economic development is an empirical issue, a lot of the debate on the matter has been based on modeling exercises little more complicated than these.

The chaotic expansion of urban spaces in Kenya limits the ability of national and local governments to provide urban security and to supply a basic social infrastructure in areas such as health, education, water, and sewage disposal facilities (Owusu, 2011). As a result slums are emerging, overcoming and swallowing what little crumbling infrastructure that already exists. Waste disposal presents a tremendous health hazard, and indoor air pollution, poor nutrition and urban crime all pose further threats. Owusu (2011) further states that slums face additional environmental challenges due to the low quality of construction materials and location on marginal ground. Many slums also flood routinely, sewage bursts and leaks and are vulnerable to accidental or malicious fires. The emerging threat of climate change is only likely to intensify these problems. The focus of urban centers must therefore be on better planning and increased investment in infrastructure such as waste water management facilities. According to Hall (2002), planning for urban growth in local authorities for African states such as Kenya requires the anticipation of urban growth, rather than simply reacting to the challenge posed. Urban planning in Kenya, for example Eldoret municipality, should not only be inclusive

and pro-poor, but must also find ways to improve the living conditions of current slum dwellers and to provide adequate alternatives to new slum formation. There is also the need for improvements in public transportation, access to services such as water and electricity, and the government's capacity to attract foreign investment to help unleash this potential.

Efforts to eradicate poverty require investments in basic education, sanitation, drinking water, housing, food supply and infrastructure for rapidly growing populations. This strains already weak economies and limits development options. Jobs must be created for growing numbers of young people entering the labor force at a time when unemployment is already widespread. The number of elderly persons requiring public support is also increasing rapidly. Sustained economic growth in the context of sustainable development is necessary to accommodate all these pressures.

2.2.3 Effects of population growth on managerial operational planning for sewerage services

Operational planning in organizations is a key component of success and must be carefully thought before being implemented. As Vandana and Melanie (2012) put it, operational planning is the process of linking strategic goals and objectives to tactical goals and objectives. Further, it describes milestones, conditions for success and explains how, or what portion of, a strategic plan will be put into operation during a given operational period. Therefore, Vandana and Melanie (2012) conclude that a five-year strategic plan would typically require five operational plans funded by five operating budgets. Based on this opinion, it is imperative for the management of any organization, and in particular the waste water management agencies, to ensure that their operational plans encompass the five domains of a business or organization i.e. finance for purposes of budget harmonization; governance and legal or policy for purposes of administration; technical for purposes of operational; HR policy for purposes of staffing.

In several studies conducted in the USA and UK, Steven et al (2010) observe that waste water management agencies were constantly "fine tuning" the operational plans to ensure cost effectiveness and efficiency. As such, section heads in all departments and sub-departments have efficiency and minimal cost as key objectives. The basic

operational plans would find economical means of achieving targets while advanced plans would go beyond targets and look at client and other people satisfaction. For example, the Masterton Wastewater Treatment Plant Operations and Management Plan goes beyond basic treatment into ensuring that the noise levels at the plant are minimal and necessary; that the odor levels are minimized below the set threshold and the maintenance is regular and above the set standards (Beca, 2009). According to Beca (2009), the operational plan of Masterton Wastewater Treatment Plant meets the standards set by the various regulatory bodies in the USA and UK.

One of the key components of an operational plan is the staffing plan. Wastewater treatment facilities are sensitive organs of any administrative area and the personnel involved in the daily operations must meet certain criteria. Staffing requirements based on the population growth patterns have been found to be a challenge due to the attached dynamism of population growth in most urban centers in Kenya. However, according to UNFPA (1994), efforts to eradicate poverty and slow down population growth require investments in basic education, sanitation, drinking water, housing, food supply and infrastructure for rapidly growing populations. This strains already weak economies and limits development options. As a result, making strategic plans for organizations that provide sanitation services such as ELDOWAS may undergo immense strains and managers, from time to time, may have to align their needs to the changing technologies and objectives. While the mission and vision may remain the same, approaches to long term problem solving are forced to change so as to accommodate these changes before the expiry of the strategic plan period (CRD, 2013).

2.3 Effect of population growth patterns on organizing for quality of service at the sewer plants in Eldoret town

Organizing involves making decisions about creating a stable, understandable framework within which employees can work together to achieve organizational goals. The way in which an organization's activities are divided, organized and coordinated is called an "Organizational Structure." This helps in creating an environment where the employees can work together. The available human resources must be given roles in the context of their abilities and skills. Organizing therefore means establishing an internal structure, assigning the roles to the people in an organization which best suit them and in

doing this to make sure, that all the tasks that are required in the fulfillment of the objectives are assigned to persons who are most suited for that task. Organizing can take three dimensions according to Dressler (2006). These are mixed, horizontal and vertical.

Organizing in waste water treatment plants in the USA involved both centralized and decentralized ways in the colonial era (Maggie and Menachem, 2007). According to Bruce (1982), progress in wastewater treatment technologies, on the other hand, involved the introduction and demonstration of many new techniques, most notably the construction of large-scale activated sludge treatment facilities. The approaches to wastewater management started changing from decentralized to centralized due to several prohibitive factors against decentralized. According to Steven (2000), residential wastewater management in seventeenth-century colonial America was organized into of privies with the outlet constructed at ground level, usually discharging into the yard, street, gutter, or an open channel serving as a sewer. Because population densities were low, privies constructed in this way did not create sanitation problems or unbearable nuisances in colonial cities, but as populations increased, so did the sanitation problems and nuisances. The majority of residents accepted the sanitation problems and nuisance conditions as a necessary part of urban life, except during epidemics or following a disease outbreak when sanitation was given considerable attention.

According to Duffy (1968), decentralized dry sewage systems were more common in Europe and Asia than in the United States because Europeans and Asians had more experience using human excrement as fertilizer and doing so cost effectively. In addition to the reluctance to effectively use human excrement in the United States, residents were not enthusiastic about maintaining or cleaning dry sewage systems. Armstrong (1976) argues that during the nineteenth century, there was considerable urban population growth in the United States. As a result of this increased population density in urban areas, the decentralized privy vault-cesspool wastewater management systems became overtaxed. Mitigation measures included increasing the cleaning frequency and constructing additional privy vaults and cesspools. The improvements, however, only slightly reduced the periodic overflows and development of nuisance conditions. The privy vault-cesspool system, as it existed then, was inadequate to handle the increased

amount of wastewater. The centralized water-carriage sewer system, on the other hand, was being promoted as the management alternative for urban areas with increasing populations (Armstrong, 1976).

In Kenya, both the centralized and decentralized systems are a common phenomenon, with the latter gaining popularity in the recent past Owusu (2011). Frequent blockages and leaks coupled with lack of adequate water has encouraged the mushrooming of decentralized pools (Chanda et al, 2010). According to Chanda et al (2010), major urban areas such as Nairobi, Nakuru, Kisumu, Eldoret and Mombasa have experienced major challenges in as far as management and organizing of waste water management plant is concerned and as such its residents have opted for the cesspools, which at times are emptied into natural water sources such as rivers. This poses a greater risk to the populations health and proper organization is called for from the major stakeholders.

2.4 Effects of population growth on managerial staffing at the sewer plants in Eldoret town

In any kind of business, human resources are the most powerful sources. How to attract outstanding personnel, how to make full use of employees' abilities and potentials in order to help achieve the organizational objectives are the questions that every leader should take into consideration. This is also known as staffing (Dessler 2006). Staffing involves identifying the required work force to carry out the tasks envisaged, inventorying & assigning the most suited tasks to the available human resources and recruiting for additional work force required, in case of a deficit. To ensure that tasks are carried out both effectively and efficiently, staffing also means keeping filled the various positions in the organization structure. Woods (2006) argues that staffing comprise of job analysis, recruiting, training and evaluating the existing work force and the new candidates.

Chanda et al (2010) argues that despite having the centralized waste water treatment plants functional with current technology available for adoption and use, staffing challenges still exist as most personnel within these companies, especially in Africa, are 'self-trained' and do not have the technical skills to handle the capacities and technical challenges. As such, planning and organizing becomes a problem (Owusu, 2010). In

management of organizations, Emma and Allan (2010) argue that the recruitment process has to consider the job for which recruitment is done, the requirements for the job and the technical experience needed to carry out such a task. Similarly, Maggie and Menachem (2007) argue that sewer plants require skilled personnel, trained in waste water treatment. The employing organization should also organize training and workshops for such personnel to acquaint them with emerging trends in technology and waste water treatment.

2.4.1 Effects of population growth on Job Analysis at the sewer plants in Eldoret town

Job analysis is the procedure through which you determine the duties of these jobs and the characteristics of the people who should be hired for them (Dessler 2006). Job analysis is the basis of all the other departmental activities. Population changes in a given service organization, especially those that offer pertinent public services, greatly affect the HR process of job analysis. Most services in such organizations are dependent of two factors: the skills of the employee and the needs of the clients. The higher the number of clients, the higher the needs hence more strain on the existing employees and skills. As such, the HR is tasked to perform a job analysis of the existing employees and identify gaps that need to be filled through recruitment or enhanced through training. In the job analysis, HR considers what jobs are needed, and writes the job description; clarify each job's tasks, responsibilities and duties. As well as job specification, the HR takes care of writing job specification should be clear about what kind of knowledge, skills and abilities are required in the work (Woods, 2006).

Job description involves defining the tasks, responsibilities and the duties of the expected new employee(s). The tasks of an employee would include the activities that he/she would engage in on a regular basis while the responsibilities of the employees include what he/she is in-charge of and must ensure is done either by him/her or any other person who may be working directly with him. A duty is the regular obligation that an employee must fulfill. It encompasses the regular tasks and responsibilities of an employee (Woods, 2006). Figure 2.1 gives the Job analysis process as postulated by Woods (2006).

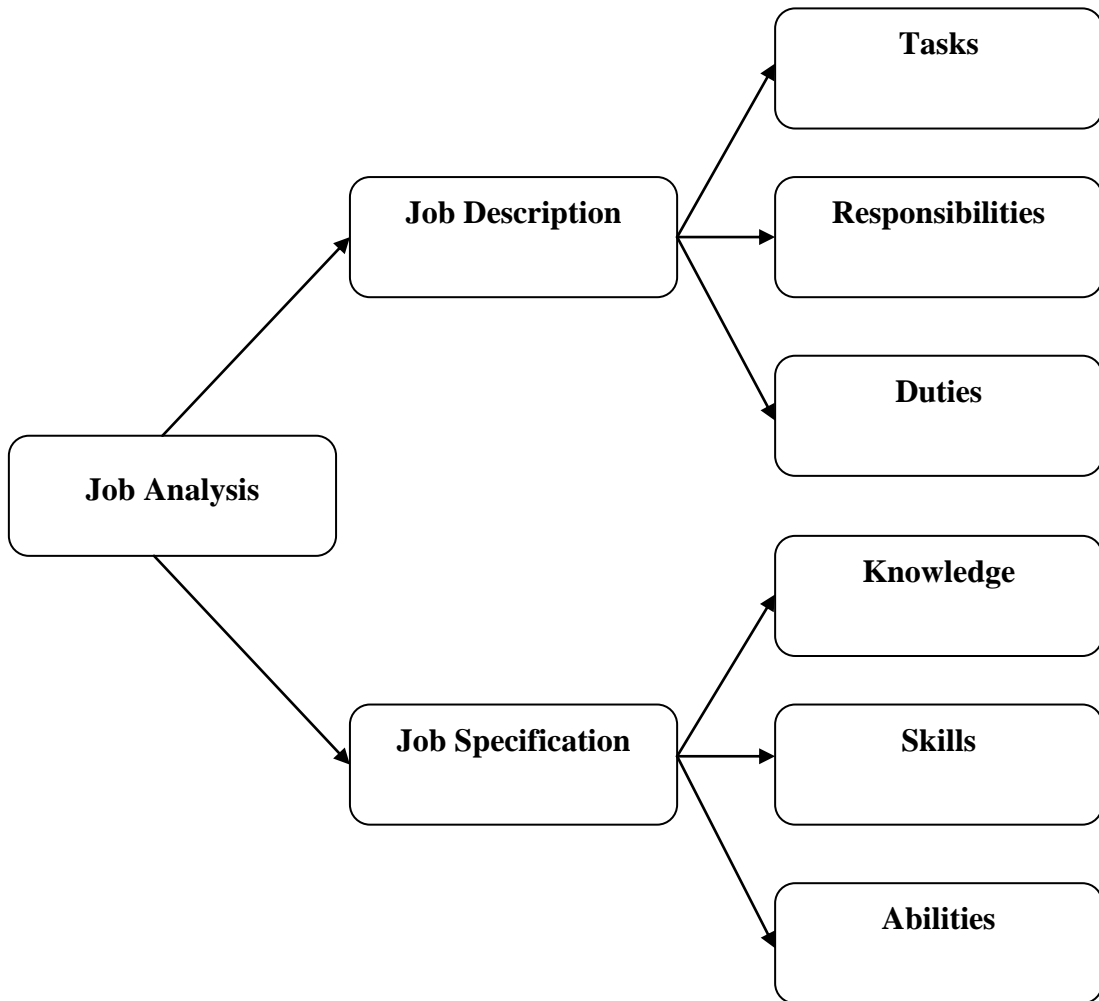


Figure 2.1: Job analysis

The Job specification encompasses designing the expected knowledge, required skills and abilities of the employee (Woods, 2006). The knowledge of the employee would be the information the employee has about the tasks he/she would be expected to carry out while in an organization while the skills are the acquired and perfected expertise he/she will be expected to possess to perform the responsibilities assigned. The Abilities of an employee would include the knowledge and skills that he/she possesses to carry out the duties assigned. While crafting the above two, the HR considers the working experiences that yield the job description and the academic qualifications to yield job specification crafted (Woods, 2006).

In this study, the Human Resource managers of organizations that offer wastewater management services to the public are faced with a challenge of the ever increasing population and the need for improved services by the population. However, with hard economic times and changing needs from the clients, the job description and specifications for new employees in these organizations become more complex (Armstrong, 1992). On the other hand, in countries like the UK and USA where provision of these services is very advanced, the employees recruited are of high academic qualifications and quite experienced. Although most may not have worked as salaried employees, DEFRA (2002) notes that most graduates in the fields of Environmental Science, Chemical Engineering and other technical areas of civil engineering have undergone rigorous training while on industrial training or volunteer service in similar organizations. This ensures that organizations are constantly fed with qualified staff (Woods, 2006).

2.4.2 Effects of population growth on recruiting at the sewer plants in Eldoret town

According to the job analysis (Figure 2.1), human resource staff responsible for recruiting would know how many employees to hire and what kind of people are to be hired. Recruiting can be divided into internal recruiting and external recruiting, as the name suggested, HR department can hire employees from workers inside the organization, a transfer from a branch, or any kind of promotion etc. Hiring from outside sources is called external recruiting (Woods 2006). According to Decenzo & Robbins (2007), internal sources of recruiting would encompass job postings, newsletters, employees as referral sources or recommendations by current employees to the HR officer. Similarly, Decenzo & Robbins (2007) also opine that external recruitment sources could be through advertisements, employment agencies, technical training and learning institutions, professional organizations and or online recruitment. It is important to note that all these are means of creating awareness about a job opening in a particular organization.

Recruiting for wastewater management facilities in minority countries such as the US and UK takes most of the dimensions postulated by Decenzo & Robbins (2007). However, for external recruiting, most professional organizations are consulted to carry

out the recruiting process on behalf of the hiring organization. On the other hand, the professional organizations would contact organizations offering similar services to the public for recommendations. These professional organizations would also do online advertisements for the same job if they fail to get recommendations from the existing organizations. In Kenya, the number of organizations offering such services as EDLOWAS are mushrooming daily hence creating a need on the technical personnel available. However, the number of institutions training such personnel are few and limited in terms of facilities. This has led to a shortage of such personnel hence the self-trained personnel who are not logistically knowledgeable in areas of plumbing, chemical and civil engineering. Most wastewater management facilities have fallen prey to such employees who are either hired on contract basis or permanent basis. Consequently, this has led numerous shoddy jobs that do not last hence posing a threat to residents of areas where sewer services are offered.

2.4.3 Effects of population growth on training at the sewer plants in Eldoret town

According to Sommerville (2007), training is the process that provides employees with the knowledge and the skills required to operate within the systems and standards set by management. On the other hand, McClelland (2002) defines training as, in the most simplistic definition, an activity that changes people's behavior. Therefore, training is the imparting of knowledge and related skills onto employees for purposes of equipping them for the tasks ahead. Training is a key element of an organization, especially where new challenges emerge more frequently than the overall employee turnover rate. As such, the employer must regularly organize for employee training so as to keep abreast with current trends.

Yafang and Wang (2008) argue that with the development of the technologies and the whole working environment, employees are required to be more skilled and qualified, even if they are a good employee today, they could be out of the line some other day if they do not keep studying and learning new skills. A company needs organized staff training if wants to be competitive among others. After successfully and carefully chosen new employees, these employees need to be trained to be on the job. Orientation will be organized in the beginning of their work and other kinds of trainings will catch up.

In developed countries, training of employees in their specific areas of specialization is a requirement for most HR managers and organizations, especially private organizations where employee competence is key to success of the organization. Consequently, most top level managers of organizations have made it part of the strategic plan to ensure that employees are trained as need arises. However, in Kenya, most organizations in the business of wastewater treatment rarely train their employees on the technical areas. Most of the employees in these organizations have minimal technical expertise and most technical work is accomplished by hiring from outside the organization. Most probably, again, the hired personnel may end up being the self-trained individuals who have minimal logistic knowledge required.

2.4.4 Effects of population growth on evaluation at the sewer plants in Eldoret town

It is necessary to have performance appraisals for employees in a period of time; the evaluation comes out from feedback of their department's representatives, co-workers and the training process etc. The evaluation encourages and motivates them to work harder and better in the future, and also helps them to improve their skills and abilities by rewarding, compensating and more practicing (Dessler 2006). Evaluation is discussed in the following section, 2.5.

2.5 Effects of population growth on the managerial evaluation process for the sewerage services and systems in Eldoret Town

Operations management for waste water treatment plants relies on asking a few key questions such as: Is the operation and maintenance of our water or wastewater system as efficient and effective as it should be? Is the organization of the operation and maintenance staff well suited to the tasks at hand? Do we have the right number of staff? What improvements should be considered? How do our operation and maintenance costs compare to those for similar systems? Are our public agency operation and maintenance costs competitive with a private operator's costs?

2.5.1 Effects of population growth on process evaluation as a component of managerial evaluation

Maggie and Menachem (2007) argue that urban wastewater management is at a critical juncture in the United States and elsewhere. Methods must again change in response to urban development, population growth, and diminishing natural resources.

Based on information in recent literature, current research focuses, and trends in the engineering and regulatory community, three aspects of wastewater management are becoming increasingly important now and will continue to be important in the foreseeable future development of wastewater management. The three aspects are decentralized wastewater management (DWM), wastewater reclamation and reuse, and heightened attention to wet-weather flow (WWF) management. Currently, consideration of these three aspects in wastewater management planning is improving the functionality of wastewater systems and creating sustainable alternatives to the traditional centralized cesspools.

Most important links between population and environmental services are institutionally contingent. Under some institutional arrangements—for example, a strong management regime, well-defined property rights, or effective community norms and sanctions—population growth in a region need not adversely affect the local environment. Access to a limited resource can be rationed or governed in some other way so that it is not overused. Or the institutional forms may be such that population growth itself is prevented by negative feedbacks halting natural increase or by diverting the growth elsewhere, through migration. If this institutional mediation ultimately proves inadequate to the task, the limits on the environmental services being drawn on would be exceeded and degradation would ensue. This can happen well short of those limits if economic or political change undermines a management regime, weakens property rights, or erodes norms and sanctions. Excessive deforestation can often be traced to such institutional breakdowns (or to ill-considered efforts at institutional reform) rather than to population growth itself. In other cases, a resource may have been so abundant that no management or sanctions were needed: that is a setting where the familiar "tragedy of the commons" may unfold as the number of claimants to the resource or their exploitative abilities increase (Hardin 1968).

2.5.2 Effects of population growth on job evaluation as a component of managerial evaluation

Physical spillover effects of human activity beyond the location of that activity, such as downwind acid rain and wastewater from industrial plants or downstream flooding caused by watershed destruction, present relatively straightforward technical problems

for design of a governance regime. The greater difficulties are likely to be political. These can be formidable even within a country, a fortiori where the environmental effects involve degradation of a global commons. Population change here raises added complications. Thus, in negotiating a regulatory regime to limit global carbon emissions, anticipated population growth in a country can be treated either as a foreordained factor to be accommodated by the international community—occasioning a response analogous to political redistricting in a parliamentary democracy or treated wholly as a domestic matter (an outcome of social policy) that should not affect assignment of emission quotas.

Adverse effects of human activity can also be transferred from one region to another through the normal economic relationships among societies, notably through trade. A poorer society may be more willing to incur environmental damage in return for economic gain, or be less able to prevent it. The concept of a community's "ecological footprint" was developed to account for such displaced effects by translating them back into material terms, calculating the total area required to sustain each community's population and level of consumption (Wackernagel & Rees 1996, Neumayer 2003). An implicit presumption of environmental autarky would disallow rich countries' buying renewable resources from poor countries; notionally, if implausibly, they could maintain their consumption by somehow reducing their population.

2.6 Theoretical Framework

Population growth is believed to spark a strain on the existing resources for as long as the growth is exponential. This study adopted the Ester Boserup's theory of population growth as postulated below.

2.6.1 The Boserup theory of population growth

Ester Boserup proposed a theory arguing that an increase in population would stimulate technologists to increase food production and other technological infrastructure for the survival of mankind. Boserup said that any rise in population would increase demand for food and resources and this would act as an incentive to change technology and avail more means of survival. Her theory can be summed up by the sentence 'necessity is the mother of invention'. Therefore population growth will spark innovators

who will solve the problems the increasing population has caused therefore making it sustainable for a growing population.

The limitation to Boserup's theory is that her idea is also based on a 'closed' community. In reality they are not closed because of migration in and out and therefore it is difficult to test Boserup's theory. Again, strains on other resources besides food were not considered, even though other factors such as infrastructure were mentioned. Boserup says that famine, war and other human related catastrophes will be prevented by human solutions in increasing food production by technology. Dependability of the population on other common facilities is also an issue. Proper management of public assets such as hospitals, schools, sewerage systems among others will similarly affect survival of the population. It is on this dimension that this study is carried out on the management of sewer systems.

2.7 Conceptual Framework

Population growth takes place irrespective of whether systems are put in place to accommodate it or not. While there are artificial means of controlling birth, population growth will still be evident among the inhabitants of a particular area or region. It is upon people in leadership positions to plan for and implement projects that would accommodate the needs of the growing population, source for funding of these projects, train personnel to work on the projects and constantly evaluate the outputs of the projects to ensure they are always at par with the strains and demands put on the essential assets such as sewer systems.

Management of sewer systems entails proper and adequate planning, funding, training of personnel and constant evaluation of projects to ensure that there are minimized leaks, improved capacities to handle the growing population and hence improve service delivery. Figure 2.1 below gives a summary of the framework.

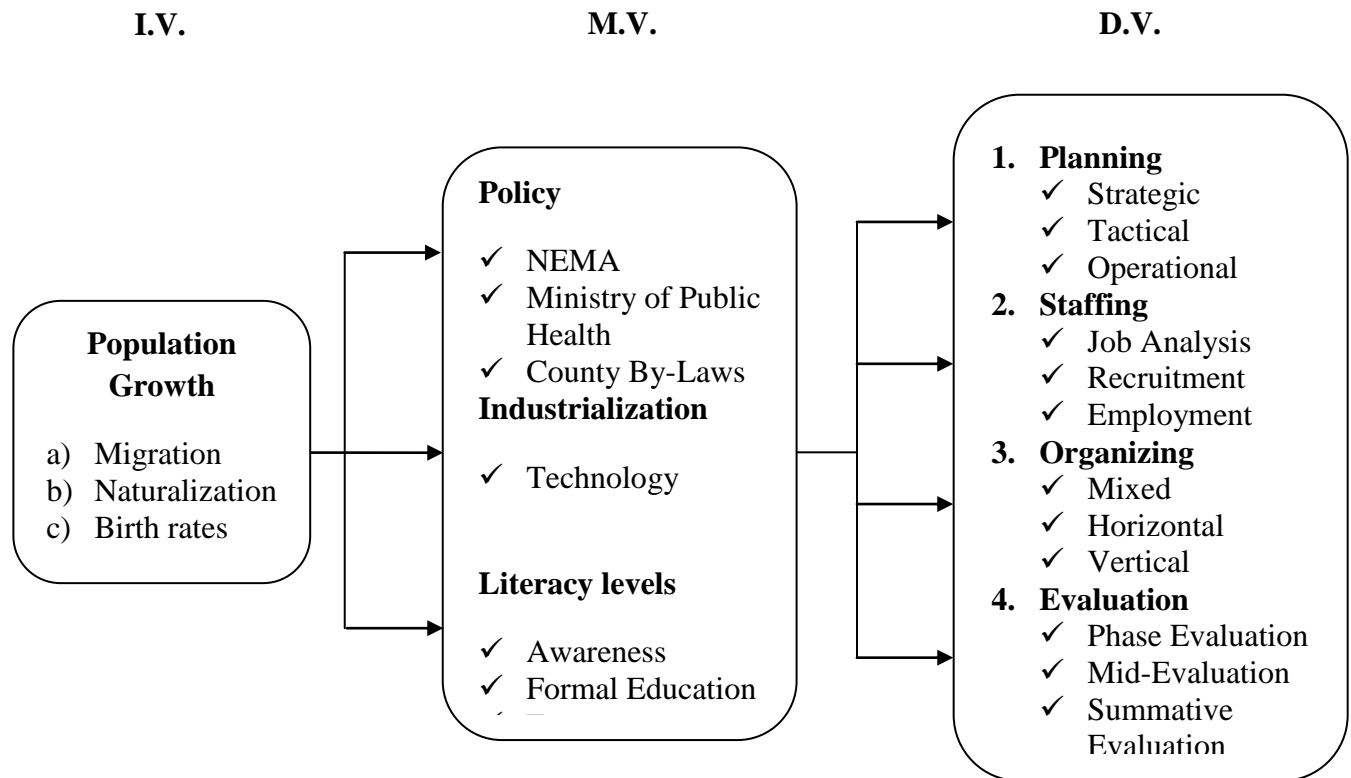


Figure 2.2: Conceptual Framework

Where I.V is the Independent Variable, M.V. is the moderating or intervening Variable and D. V. is the dependent variable.

2.8 Gap in Literature Review

The Boserup's theory of population growth failed to address the other aspect of strains on the public assets. Other theories equally failed to address the same issue but others such as economic and resources strains among others. It is on this foundation that this study chose to address the strain that population growth exerts on basic public assets, of key interest being sewerage systems.

CHAPTER THREE RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter presents the research design, target population, sample selection procedure and the sample size, data collection instruments and data collection procedure. It also presents how data was analyzed and the various ethical considerations in the study.

3.2 Research Design

Since the study seeks to assess the effects of population growth on the management of sewer projects in local government authorities, the research design that was adopted was descriptive design. Descriptive research design allows one to be able to use various forms of data as well as incorporating human experience. It gives researchers the ability to look at whatever they are studying in so many various aspects and can provide a bigger overview as opposed to other forms of research (Weiss (1998) and Mugenda and Mugenda (2003)).

3.3 Target Population

The target population for this study comprised of the 216 staff members in Eldoret Local Government Authority, Water and Sewerage Department, which is the arm of the Local Government Authority that deals with sewer projects. This yielded a target population of 216.

3.4 Sample size and sample selection

According to ELDOWAS 2013 data, there were 40,917 sewer connections in Eldoret town. There were 216 both senior and junior staff members in ELDOWAS. This gave a total of 41,133 people who were the target population. The study employed both purposive and non-purposive sampling techniques in identifying the sample size.

3.4.1 Sample size

The sample size was determined by using the Mugenda and Mugenda's (2003) proposition of 30% of the target population. As such, 65 respondents from the staff members participated in the study.

3.4.2 Sample selection procedure

Sekaran (2010) states that sample selection procedure entail how the actual respondents will be identified to participate in the study. The study used probability and non – probability sampling techniques. Probability sampling technique was used to randomly select respondents from the junior staff members of ELDOWAS, the CBD and the residential estates. Non-probability (purposive sampling) technique was used to identify the senior and middle level sewer plant managers. This was done to ensure that operations managers and plant managers who had rich information with regards to the objectives of the study participated in the study.

ELDOWAS had only 2 sewer plants in Eldoret but managed form one central office. Officers in-charge of the sewer plants were regarded as section heads or heads of departments. This means that there was only 1 manager who was sought and requested to participate in the study by way of interview. There were 3 operations managers who were requested to participate in the study by way of interviews. The remaining 61 respondents were selected through simple random selection from the junior staff members of ELDOWAS.

3.5 Data Collection Instruments

The study used both quantitative and qualitative data from primary and secondary sources. Mugenda and Mugenda (2003) and Emma & Alan (2009) observes that use of both qualitative and quantitative data collection methods employs strategies of inquiry that involve collection of data either simultaneously or sequentially to best understand research problems. This is also known as mixed method of research (Creswell, 2003). On the other hand, Sambili (2000) points out that using a combination of qualitative and quantitative methods increases validity because the strengths of one approach can compensate for the others weaknesses. Open-ended and closed questionnaires were used to collect both qualitative data for this study. According to Kothari (2008), questionnaires are cheap to administer and are free from biasness. Kothari further states that respondents have adequate time to give well thought out answers and large samples can be made use of and thus the results can be made more dependable and reliable. Mugenda and Mugenda (2003) also argue that questionnaire is commonly used to obtain data about population, since each item is developed to address a specific objective, research

questions or hypothesis of the study. As such, questionnaires were administered to both the managerial staff and the technical staff of ELDOWAS.

Interview schedules were used to guide the researcher when collecting data from the top level managers of ELDOWAS, which is the organ responsible for the management of the sewer system. It also is responsible for billing and connection and disconnection of clients to the sewer line. Interview schedule enabled the researcher to collect the information based on the objectives of the study and (Kothari, 2008) balance between quality and quantity of data collected and also access more information that may not have been collected by the questionnaires. The study employed the respondent type of interview where the interviewer/researcher retained all control throughout the process.

3.5.1 Pilot Testing of instruments

The study first constructed the research instruments which were pre-tested first to make appropriate modifications before embarking on the main study. The pilot study was carried out in Kapsabet town where local business people were requested to fill in questionnaires and respond to interview questions. Similarly, the managers of Kapsabet local authority were asked to fill in questionnaires and respond to interview questions.

During piloting, the study familiarized itself with the nature of respondents and their expectations during the main study. The pilot study was conducted in two phases, two weeks apart. After the first pilot study, the data collection instruments were checked for errors and corrections were made. The second phase was carried out to ensure that no more errors were left, whereby any other identified error was corrected before embarking on to the main study in Eldoret town. Modifications were done on the sampling procedure, hypothesis or even research objectives if relevant and constructive suggestions arised.

3.5.2 Validity of research instruments

Validity is the accuracy and meaningfulness of inferences which are based on the research results (Mugenda and Mugenda, 2003). The methods of determining validity of research instruments are: content, construct and criterion. The study utilized content validation measure to determine the validity of the research instruments. In this work, the study supervisors assessed the validity of the research instruments to be used in the study.

Similarly, the study employed use of a content validation measure, which is usually subjective, thorough and representative of the wider body of material that the research is trying to assess. In order to establish content validity for quantitative data, the researcher obtained the ratio of the number of items rated as relevant per objective to that of the total number of items in the questionnaire. When converted into a percentage, a value greater than 50% validated the instrument while any value less than 50% invalidated the instrument.

Qualitative validity of instruments was ensured by processing data into manageable proportions through editing, coding, and tabulation methods. Data collected was checked while still in the field to ensure that all questions were answered. Contradictory information was removed so as not to confuse the respondents. By coding, answers to each item on the questionnaire were classified into meaning full categories. Tabulation was used to obtain frequencies and percentages of each item.

3.5.3 Reliability of research instruments

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials. Weiss (2008) explained although all measures contain errors, the more reliable the method or instrument, the less likely it is that these influences will affect the accuracy of the measurement. Test – retest technique was used to determine the reliability of the research instruments to be used by the study. This involved administering the same measure of the variable on two separate occasions, 2 weeks apart in a different environment e.g. Kapsabet Local Government Authority. The interval of time between administrations should be considered with this form of reliability because test-retest correlations tend to decrease as the time interval increases (Robson, 2002). Therefore the period of two weeks interval increased the correlation value as opposed to a longer period of time. Thereafter, a reliability co-efficient was generated and according to Creswell (2008), a reliability coefficient of 0.7 or more implies that there is a high degree of reliability of the data.

3.6 Data Collection Procedures

Kerlinger, (1978) states that in order to implement the general objectives and plans of a research study, specific and relevant methods of data collection must always be used.

He further states that problems dictate methods to a considerable extent, but methods, their availability, feasibility and relevance influence problems' understanding and possible solutions. McMillan and Schumacher (1993) argue that in order to begin the research, the researcher will have to formally acquire the necessary documents that will introduce him/her to the expected respondents, stating the intent of the researcher and the purpose for the study. These documents must also state when and for how long the study will be carried out. This will enable the student secure a research permit from the relevant ministry, upon which the student will provide the same to the local authorities during data collection.

Questionnaires were administered to the respondents on pre-arranged dates with the help of research assistants who were hired and trained as per the requirements and objectives of the study. The issues covered during training were ethical guidelines in conducting research. Similarly, the researcher in person conducted the interviews on pre-arranged dates. The interview sessions were conducted and the responses were recorded on a sheet of paper., the researcher also used voice recorders to record the interviews for further analysis and transcription. The interviews were thought out beforehand and standardized so that all participants were asked the same questions in the same order. Also appointments were made with top level management of the local government authorities for the said interview before administering the interview.

3.7 Data Analysis Procedures

Collected data was checked for errors of omission and commission. The data collected was classified, measured, analyzed and interpreted to establish the influence of population growth on the management of sewer systems in Eldoret town. The study employed both quantitative and qualitative research in its data analysis. Sandelowski (2000) states that linking the results of qualitative and quantitative analysis techniques is accomplished by treating each data set with techniques usually used with that data at first. Yin (2003) pointed out that analysis of data involves examining, categorizing, tabulating or otherwise combining the evidence to address the initial propositions of a study. Before data entry, screening was done to ensure that responses were legible and understandable

and that responses were within an acceptable range and were complete, and all of the necessary information had been included (Leary, 2004).

The data collected was analyzed, with respect to study objectives, using both descriptive (Quantitative) and inferential statistics (Qualitative). When analyzing quantitative data, correlation design was used to assess the degree/strength of relationship that existed between the determinants (Independent variables) and dependent variable and the relationship between variables. Statistical Package for Social Sciences (SPSS) was used in data coding, entry and analysis. Descriptive statistics allows the researcher to describe the data and examine relationships between variables, while inferential statistics allows the researcher to examine causal relationships between qualitative and quantitative data (Leary, 2004). In many cases, inferential statistics allow researchers to go beyond the parameters of their study sample and draw conclusions about the population from which the sample was drawn. The qualitative analysis involves the idea of using themes and categories as advised by Charmaz (1983) who purports that categories serve to pull together and give meaning to a series of otherwise discreet events, statements, and observations in the data. Analyzed data was presented using tables, charts and narrations.

3.8 Ethical Considerations

Sieber and Stanley (1988) defines ethics as a branch of philosophy which deals with one's conduct and serves as a guide to one's behavior. Moreover, these principles are intended to protect research participants from harm (Sieber and Stanley, 1988). Since all respondents participated in the study voluntarily and willingly, participation was clearly explained to the participants before they signed in their consent forms. Participants had the freedom to withdraw from the study at any stage. Cohen and Manion (1994) suggest that informed consent is an important issue that one has to consider. The purpose of the study was explained to the participants so that they could make their own informed choices. Additionally, the study guaranteed confidentiality and anonymity to the participants. Since the respondents were aware of the cultural norms of the study arena, the study made sure that words and language that seemed to be sensitive to religion, culture, marriage status or tribe were be avoided. The names of all informants were coded to conceal their identity and to maintain confidentiality.

CHAPTER FOUR
DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents analyses and interprets the data collected through questionnaires and interviews schedules. The qualitative data was organized in broad themes that answered research objectives. Quantitative data was organized in frequency counts and converted to percentage for clear presentations. A total of 65 questionnaires were issued and a response rate of 93.84% was recorded where 61 filled questionnaires were returned.

4.2 Demographic Information

This section presents and analyzes the demographic information as collected.

4.2.1 Missing values analysis for demographic information

The researcher issued 61 questionnaires to the junior technical staff of ELDOWAS. As observed, the respondents gave their responses willingly and openly. However, there were cases where the respondents did not answer certain questions. There were 56 respondents who disclosed their gender, with 5 (8.2%) opting not to disclose. 2(3.3%) of the respondents also did not disclose their ages while 7(11.5%) were unable to tell the length of time they have been working at ELDOWAS. 4(6.6%) of the respondents likewise did not disclose their highest academic level attained while 5(8.2%) did not give information relating to the department where they were working.

Table 4.1: Univariate analysis of missing values

Univariate analysis of missing values					
	N*	Mean	Std. Deviation	Missing	
				Count	Percent
Gender	56	1.3750	.48850	5	8.2
Age	59	2.7119	1.05129	2	3.3
Length of service	54	1.9444	1.07135	7	11.5
Highest Academic Level Attained	57	3.1228	.94624	4	6.6
Department working	56			5	8.2

**Where N is the number of respondents who responded to questions relating to the variables listed.*

Table 4.2: Case Processing Summary

	Case Processing Summary					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Dept. Working *	56	91.8%	5	8.2%	61	100.0%
Age Bracket						
Dept. Working *	51	83.6%	10	16.4%	61	100.0%
Length of Service						
Dept. Working *	56	91.8%	5	8.2%	61	100.0%
Position Held						
Dept. Working *	54	88.5%	7	11.5%	61	100.0%
Highest Academic Level						

From the study, there were a total of 4 female respondents, 1 respondent from each department who participated in the study while there was a total of 49 male respondents. 31 respondents from the technical department, 1 respondent from the commercial department, 6 respondents from the finance department and 11 respondents from the administration department. The table below illustrates this.

Table 4.3: Department Working by Gender Cross-tabulation

Department Working by Gender Cross-tabulation				
		Gender		Total
		Male	Female	
Department	Technical	31	1	32
	Commercial	1	1	2
	Finance	6	1	7
	Administration	11	1	12
Total		49	4	53

This finding may be attributed to the fact that the nature of work at ELDOWAS has been mainly perceived to benefit men and not women.

The study also found out that there were more employees aged between 21 and 30 years. There were 6 respondents aged between 18 – 20, 19 aged between 21 – 25, 21 aged between 26 – 30 and 10 aged over 30 years.

Table 4.4: Department Working by Age Bracket Cross-tabulation

		Age Bracket				Total
		18-20	21-25	26-30	> 30	
Department	Technical	3	13	10	6	33
	Commercial	0	0	3	0	3
	Finance	2	1	2	2	7
	Administration	1	5	4	2	13
Total		6	19	21	10	56

The study established that the personnel at ELDOWAS was youthful and energetic and was in a position to carry out tasks as assigned.

The study also revealed that most employees had been working at ELDOWAS for less than 4 years, with a majority of 39 having worked there for less than 2 years.

Table 4.5: Department Working by Length of Service Cross-tabulation

		Length of Service (Years)					Total
		< 1	1- 2	2 - 4	4 - 6	> 6	
Department	Technical	16	7	4	2	1	30
	Commercial	1	2	0	0	0	3
	Finance	2	2	1	0	0	5
	Administration	3	6	3	0	1	13
Total		22	17	8	2	2	51

It can be concluded that this trend implies that there is high employee turnover rate at ELDWAS or there is a higher employee movement rate between departments of the Local Authority where ELDOWAS has no jurisdiction.

The study also established that 17 respondents had a post secondary certificate, 18 had a diploma while 2 had a university degree.

Table 4.6: Dept. Working by Highest Academic Level Cross-tabulation

		Highest Academic Level					Total
		Primary	O-Level	PSC	Diploma	Degree	
Department	Technical	1	7	12	12	0	32
	Commercial	0	0	1	2	0	3
	Finance	0	1	2	2	2	7
	Administration	0	8	2	2	0	12
Total		1	16	17	18	2	54

This implies that ELDOWAS has the necessary qualified and skilled manpower to handle the technical tasks that arise on a daily basis.

4.3 Effects of population growth patterns on managerial planning at the sewer plants in Eldoret Town

The researcher sought to know whether there were any perceived population changes in the Eldoret town and whether employees of ELDOWAS were aware of these changes. Similarly, the study also sought to find out if there were any major changes in the number of clients using the sewer services. As such, the study endeavored to find out the effect of these changes on the approach to planning by management.

From the findings, only 1 respondent did not know whether there any population changes, while all the other 32 respondents either had noted a significant, fair or just an increase in the population. There were three respondents from the commercial who similarly agreed that there had been a population increase while 6 from the finance also agreed with this opinion. 12 respondents from the administration department also had noted an increase in Eldoret. This information is presented in Table 4.7 below.

During the interview sessions with the section heads of ELDOWAS, most respondents (section heads and managers) were optimistic that, although their planning process had been previously challenged as a result of the emerging needs, the planning process had generally become sophisticated. One of the respondents was quoted as below:

“Unlike a few years ago when we made simple plans and they would sustain us through an entire two or three years, things are different now..... the usage of the services offered has changed drastically since the number of people has changed... some know how delicate this is some do not know... and so you end having all sorts of waste into the line...”

Table 4.7: Dept. Working by Population Changes Cross-tabulation

Dept. Working * Population Changes Cross-tabulation					
	Population Changes				Total
	Significantly Increased	Fairly Increased	Increased	Don't Know	
Technical	11	13	8	1	33
Commercial	1	2	0	0	3
Finance	2	1	3	0	6
Administration	5	6	1	0	12
Total	19	22	12	1	54

From the findings, it is apparent that the staff at ELDOWAS was aware of the changes in the population size. This implies that it is possible also for senior managers and other major stakeholders were aware of these changes in the population in the recent past and thus, should have plans to accommodate the needs of the growing population.

When asked about the changes in the number of clients using the sewerage services, there was only 1 respondent who did not know whether there had been an increase or not. There were 21 respondents from all the four departments who had noted a significant increase in the number of clients using the sewerage services. There were also 23 respondents from all the four departments who had noted a fair increase while 11 had noted just an increase in the number of clients using the sewer services of ELDOWAS.

On an interview session, respondents were quick to react to the question whether the population had had a direct impact on their services or not. One was quoted as:

“...definitely the number of people has suddenly burst from nowhere in the last five years. ...initially we feared that the political factor would affect the population growth in Eldoret but we were proven wrong. Instead the opposite has happened, ...the

number of clients using our services has changed upwards. ...you know in as much as the number of clients has not increased, the number of people using the services has increased.... It is not necessary that you have a sewer line for us to make projections based on the client increase, what about those who come to town or work in town but do not have the services at home? ... all these are users of the services and we use various techniques to make projections so that we accommodate these users..."

Table 4.8: Dept. Working by Changes in Number of Clients Cross-tabulation

Dept. Working by Changes in Number of Clients Cross-tabulation					
Changes in Number of Clients					
	Significantly Increased	Fairly Increased	Increased	Don't Know	Total
Technical	11	14	7	1	33
Commercial	1	2	0	0	3
Finance	3	1	3	0	7
Administration	6	6	1	0	13
Total	21	23	11	1	56

This, again, implies that the staff of ELDOWAS was aware of the changes in the number of clients using their sewerage services and probably might have affected the usage of the wastewater processing plant and its capacities and ability to handle wastewater.

Asked whether the current sewer capacity had been over whelmed by the growing population and client size, 50 out of the 61 respondents who participated in the study agreed with the opinion that the sewer capacity had been exceeded. Only 3 did not agree. The other 8 respondents opted not to respond to this question. Management and other section and department heads seemed also to agree with the opinion that the sewer capacities had been exceeded.

The managers of ELDOWAS were quick to note that the capacity of the sewer plants were being outrun by the effluent discharge into the plant but had made appropriate plans to counter that. They also noted that there was a major construction

project of a sewer plant going on in Kipkenyo, Eldoret and once completed would be able to handle double the capacity the Huruma plant handles.

Table 4.9: Dept. Working by Opinion on Sewer Capacity Exceeded Cross-tabulation

		Opinion on Sewer Capacity Exceeded		
		Yes	No	Total
Department Working	Technical	29	2	31
	Commercial	3	0	3
	Finance	7	0	7
	Administration	11	1	12
Total		50	3	53

On responding to this question through an interview session, the managers of ELDOWAS also agreed that the current sewer plant's capacity had been exceeded and that there were already construction works going on to expand the Kipkenyo site while the exceedingly strained Huruma plant had most of its wastewater input being diverted to the Kipkenyo plant.

The study also sought to find out if there any untapped sewer line resources or connections in Eldoret and 52 out of 55 respondents agreed that there were regions in Eldoret that had sewer lines but very few people had subscribed to these services. According to management, there were regions that were not utilizing the services offered by ELDOWAS such as Munyaka, Sukunanga among others.

Table 4.10: Dept. Working by Regions with Untapped Sewer Lines Cross-tabulation

		Regions with Untapped Sewer Lines		
		Yes	No	Total
Department Working	Technical	31	1	32
	Commercial	3	0	3
	Finance	6	1	7
	Administration	12	1	13
Total		52	3	55

Managers were quick to give possible reasons why they thought their services were not being fully utilized despite experiencing strains in the processing plans. Some attributed this to lack of awareness, poverty, lack of interest and most notably, the sinking of septic tanks by landlords that were periodically emptied. However, they noted that the sewer systems in this regions were either not fully developed or most clients were not within the proximity of the sewer line for ease of connection; and that water services in these regions were being utilized.

4.4 Effects of population growth pattern on managerial organizing for quality of service at the sewer plants in Eldoret town

As one of the objectives, the researcher sought to find out the effects of population growth on the managerial organizing for quality of service for the sewerage services in Eldoret. Cross-tabulations tables were generated to analyze the various questions that would help the researcher address this objective. However, some respondents opted not to answer some of the questions. This is presented in the next section.

4.5.1 Missing Values

When a cross-tabulation for the responses on the department where respondents were working with presence of service awareness activities, presence of maintenance works, types of maintenance works and presence of surveys to assess and collect views was done, there were 6 (9.8%), 8(13.1%), 5(8.2%0 and 8(13.1%) missing responses respectively. The table below illustrates this.

Table 4.11: Case summary

	Case Summary					
	Valid		Missing		Total	
	N	%	N	%	N	%
Dept. Working <i>by</i> Awareness Activities	55	90.2%	6	9.8%	61	100%
Dept. Working <i>by</i> Presence of maintenance work	53	86.9%	8	13.1%	61	100%
Dept. Working <i>by</i> Type of maintenance	56	91.8%	5	8.2%	61	100%
Dept. Working <i>by</i> Surveys to collect views	53	86.9%	8	13.1%	61	100%

From the study, a majority of respondents (43 out of 53 who responded to this question) disagreed with the opinion that surveys were carried out to collect information relating to services offered. 24 respondents in the technical department, 3 from the commercial department, 6 from the finance department and 10 from administration answered ‘No’ to this question.

Table 4.12: Department Working by Surveys to collect views Cross-tabulation

		Surveys to collect views		
		Yes	No	Total
Department Working	Technical	7	24	31
	Commercial	0	3	3
	Finance	1	6	7
	Administration	2	10	12
Total		10	43	53

From the above findings, it is implied that no surveys are carried out to collect information relating to the quality and state of service offered by ELDOWAS. However, interviewed managers and section heads disagreed with this opinion and cited field assessments and customer notifications as ways through which the surveys were conducted. They also noted that there was a customer care department that was also set up to collect views from clients and the public at large relating to sewer services. However, asked if their contacts were available to the public, they agreed that their contacts were only available online and on the wastewater and water bills that were distributed to clients, implying that if one was not a client, he/she would have to go there in person to get or give information visit their website to get the contact details of ELDOWAS.

From the findings, 22 respondents from the technical department agreed that there were maintenance works done on the sewer line in Eldoret. 5 and 9 respondents from the finance and administration departments respectively also agreed that there were maintenance work being carried out on the sewer lines.

Table 4.13: Dept. Working by Presence of maintenance work Cross-tabulation

		Presence of maintenance work		
		Yes	No	Total
Department Working	Technical	22	10	32
	Commercial	0	2	2
	Finance	5	2	7
	Administration	9	3	12
Total		36	17	53

The above statistics, it is noted that while maintenance works were carried out, they only addressed areas that were already affected. No improvement works were carried out on sewer lines without necessarily having either a burst or blockage. During the interviews, managers and departmental heads noted that in most cases, the maintenance work was usually done on sewer lines with existing problems. However, they observed the reason for this is that most of the sewer lines and infrastructure were old and required an overhaul since the cases of blockages and bursts had increased in the recent past and that no major changes had been made on the system since it was put up.

The researcher also sought to understand the types of maintenance works carried out on the sewer lines. From the responses collected, there were 11 respondents citing regular cleaning, 25 citing regular checks for blockages and bursts, 14 for expansions and 6 for replacement of worn out segments that cause leaks.

Table 4.14: Dept. Working by Type of maintenance Cross-tabulation

	Type of maintenance				Total
	Regular Cleaning	Regular checks	Expansion	Worn out segments	
Technical	6	16	7	4	33
Commercial	0	1	2	0	3
Finance	3	2	2	0	7
Administration	2	6	3	2	13
Total	11	25	14	6	56

It is observed that the above findings slightly contradict the findings relating to the presence of maintenance works in that, while there are more respondents citing various types of maintenance works as being carried out, there were few agreeing with the presence of maintenance works going on. However, the above findings imply that there are deliberate efforts being made to improve the quality of service offered by ELDOWAS.

While trying to measure quality of service, the researcher sought to find out if there was any system (automated) that was used to notify the technical department of any bursts, leaks or blockages with the sewer line and 38 out of 55 respondents who answered disagreed with the opinion on the availability of an automated notification service. However, 17 agreed that there was such a service. During the interviews, managers of ELDOWAS agreed that there was a notification system that was partially automated.

Table 4.15: Dept. Working by Automated Notification Services Cross-tabulation

		Automated Notification Services		
		Yes	No	Total
Department	Technical	11	22	33
	Commercial	1	2	3
	Finance	3	3	6
	Administration	2	11	13
Total		17	38	55

It is observed that there is no a fully automated notification system regarding the sewer services offered by ELDOWAS. This greatly hampers quality service delivery

When asked to rate the quality of service offered at ELDOWAS, 2 respondents agreed that the quality of service was excellent while 17 said it was good. 23 said the quality of service was average, 11 said it was bad while 2 could not rate the quality of service. The managers rated their quality of service as good during their interviews.

Table 4.16: Dept. Working by Quality of Service Cross-tabulation

		Quality of Service					Total
		Excellent	Good	Average/ Fair	Bad	Can't Tell	
Department Working	Technical	0	11	14	8	0	33
	Commercial	1	1	0	0	1	3
	Finance	0	3	2	2	0	7
	Administration	1	2	7	1	1	12
Total		2	17	23	11	2	55

From the above, it is observed that the quality of service is average. The managers' responses during interviews similarly implied the same and noted plans were underway to automate the services for better service deliver.

4.5 Effect of population growth patterns on managerial staffing at the sewer plants in Eldoret Town

While trying to assess the effects of population growth patterns on the managerial staffing at ELDOWAS, questionnaires were issued to both the staff of ELDOWAS and matching questions were posed. There were 55 respondents out of 61 who responded to the question relating to unmatched technical jobs with skills, 54 responded to the question relating to colleagues with similar skills and qualifications, 56 responded to question relating to regular recruitment exercise and 56 responded to question relating to types of adverts for vacancies. The average response rate for questions relating to this objective was 90.6%.

Table 4.17: Case Processing Summary

	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Dept. Working <i>by</i> Unmatched technical jobs without skills	55	90.2%	6	9.8%	61	100%
Dept. Working <i>by</i> Colleagues with Similar Skills and Qualifications	54	88.5%	7	11.5%	61	100%
Dept. Working <i>by</i> Regular Recruitment Exercises	56	91.8%	5	8.2%	61	100%
Dept. Working <i>by</i> Adverts for vacancies	56	91.8%	5	8.2%	61	100%

Assessing the possibility of staff being assigned jobs that require higher levels of skills and qualification, 30 respondents from the technical department agreed that they have previously been assigned tasks that do not match their skills and qualifications. 3, 6, and 11 respondents from the commercial, finance and administration departments respectively attested to this. Interviewed managers attested to this and attributed it to presence of “too many” maintenance jobs than the existing staff could handle. On the other hand, they said that hiring more staff for the jobs would increase their wage bill to an unmanageable level that was not cost-effective.

Table 4.18: Dept. Working by Unmatched technical jobs without skills Cross-tabulation

Dept. Working by Unmatched technical jobs without skills Cross-tabulation				
		Unmatched technical jobs without skills		
		Yes	No	Total
Dept. Working	Technical	30	3	33
	Commercial	3	0	3
	Finance	6	0	6
	Administration	11	2	13
Total		50	5	55

The study established that technical staff at ELDOWAS were assigned responsibilities that they did not have the know-how or matching skills in handling and most times did sub-standard jobs. Managers attributed this to lack of staff skilled in specific areas given the fact that needs and challenges were changing as the number of clients grew.

The study also sought to know whether staff at ELDOWAS had colleagues with same skills in the same department and 41 out of the 54 respondents who answered this attested to this. Only 13 respondents disagreed.

Table 4.19: Dept. Working by Colleagues with Similar Skills and Qualifications Cross-tabulation

Dept. Working by Colleagues with Similar Skills and Qualifications Cross-tabulation				
		Colleagues with Similar Skills and Qualifications		
		Yes	No	Total
Dept. Working	Technical	26	6	32
	Commercial	3	0	3
	Finance	5	1	6
	Administration	7	6	13
Total		41	13	54

The presence of more than 1 person with similar skills helps encourage the staff in that responsibilities can be shared or worked on together hence improving quality.

15 out of 33 respondents in the technical department agreed that there were regular recruitment exercises while 18 disagreed. 3, 6 and 8 in the commercial, finance and administration departments also disagreed with 1 and 5 respondents from the finance and administration attesting to this. Managers who participated in the interview noted that in the recent past there have been very few recruitment exercises going on since most effort was being directed to the new wastewater processing plant that was being put and that most recruitment exercises were done on this site.

Table 4.20: Dept. Working by Regular Recruitment Exercises Cross-tabulation

		Regular Recruitment Exercises		
		Yes	No	Total
Dept. Working	Technical	15	18	33
	Commercial	0	3	3
	Finance	1	6	7
	Administration	5	8	13
Total		21	35	56

From the above findings, it is established that there were minimal recruitment exercises taking place at ELDOWAS despite having noted challenges with staff and amount of work in the previous section. However, managers noted that once the construction of the Kipkenyo plant was over, they would recruit more skilled staff and expand their sewer lines to areas that need their services but are under-served.

The researcher also sought to find how vacancies were advertised and it was noted that some adverts were placed on print media, TV and radio with 9 respondents confirming this. 20, 16, 8 and 3 respondents cited in-house adverts, notice boards, websites and recruiting agencies as ways of advertising for vacancies at ELDOWAS.

Table 4.21: Dept. Working by Adverts for vacancies Cross-tabulation

Dept. Working by Adverts for vacancies Cross-tabulation						
	Adverts for vacancies					Total
	Print, TV, Radio	In-house adverts	Notice boards	Websites	Recruiting Agencies	
Technical	8	8	11	4	2	33
Commercial	0	1	0	1	1	3
Finance	1	3	2	1	0	7
Administration	0	8	3	2	0	13
Total	9	20	16	8	3	56

While it has been established that there has been very minimal recruiting exercises taking place within ELDOWAS within the recent past, it should be noted that the few that have vacancies that have arisen have been mainly advertised through in-house adverts and notice boards. This means that the public in most cases may not be aware of such vacancies hence not able to apply for the same. However, interviewed managers on the other hand attested to this and said that based on in-house evaluation of staff within other departments of ELDOWAS (not covered in this study), it was discovered that there are staff members working on casual terms but had the required qualifications and skills and rather than recruiting someone from outside the organization, it was proper for the organization to first absorb those on board before absorbing those outside.

4.6 Managerial evaluation process of the sewer services and systems

The researcher sought to know whether managers and department heads carried out evaluation exercises to verify job quality. Out of the 61 respondents, 6 respondents did not respond to all questions relating to evaluation. The response rate for these questions was 90.2% on average.

Table 4.22: Case Summary

	Case Summary					
	Valid		Missing		Total	
	N	%	N	%	N	%
Dept. Working by Evaluation of Quality of Work	55	90.2%	6	9.8%	61	100.0%
Dept. Working by Impact of Job Evaluation	55	90.2%	6	9.8%	61	100.0%
Dept. Working by Report Reviews	55	90.2%	6	9.8%	61	100.0%

In an attempt to verify whether there was evaluation of quality of work going on, 22, 3, 5, and 11 (41 in total) respondents from the technical, commercial, finance and administration departments respectively attested to this while only 14 respondents from all the departments answered no.

Interview sessions carried out revealed that the level of evaluation was mainly to assess whether work had been done rather than identify faults on the sewer lines or assess the quality of work done. As such, this is why there were many cases reported regarding bursts and blockages on the sewer lines in most estates. The respondents also agreed that the reports mainly came from highly populated estates such as Huruma and the CBD of Eldoret town.

Table 4.23: Dept. Working by Evaluation of Quality of Work Cross-tabulation

		Evaluation of Quality of Work		Total
		Yes	No	
Dept. Working	Technical	22	10	32
	Commercial	3	0	3
	Finance	5	2	7
	Administration	11	2	13
Total		41	14	55

It is evident from the findings that evaluation for quality of work is done at ELDOWAS. Managers cited collection and reviewing of reports as a way of evaluating the works done and assessing their quality.

The researcher also sought to know if the job evaluation had any impact on the staff and 5 respondents said that the evaluation may lead to promotions/demotions of individuals. 20 respondents said that ELDOWAS would more often recognize staff members for their quality of work done and 3 respondents said that job evaluation would some times make them be rewarded or have their salary increased by their employer. 24 respondents said that the job evaluation conducted by ELDOWAS had no impact on their jobs and status.

Table 4.24: Dept. Working by Impact of Job Evaluation Cross-tabulation

Dept. Working by Impact of Job Evaluation Cross-tabulation						
	Impact of Job Evaluation					Total
	Promotion/ Demotion	Recognition	Awards	Salary increase	No Impact	
Technical	3	10	2	3	15	33
Commercial	1	1	0	0	1	3
Finance	1	4	1	0	1	7
Administration	0	5	0	0	7	12
Total	5	20	3	3	24	55

From the findings, job evaluation conducted at ELDOWAS mainly leads to recognition. Managers said that recognition of performing employees was a way of motivating them while factors such as salary increments were done on an annual basis. Managers similarly noted that job evaluation at ELDOWAS has enabled them plan effectively for the emerging changes as a result of population and client growth that has had serious impact on the quality of services they offer.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings, draws conclusions based on the findings, makes recommendations on how to solve the problem and also suggests areas that need further research.

5.2 Summary of findings

From the findings, there were more male employees than female employees, probably due to the nature of work involved. Most employees were aged between 21 and 30 years with a majority having worked for less than 4 years. Equally, this majority had at least a post secondary certificate where 18 had a diploma, 17 had a certificate and 2 had a university degree. This implied that ELDOWAS had employees with the necessary skills to undertake the technical responsibilities, though few for the amount of work present.

To address the effects of population growth patterns in managerial planning, it was noted that there had been a population and client increase at ELDOWAS in the recent years and that the sewer capacity had been exceeded. However, there were plans underway where a new wastewater management plant was being put up to address this issue. Likewise, new measures were being put in place to enhance communication between the client and the organization by setting up an automated notification system that would handle notifications of sewer line faults for instant correction.

The study also revealed that there are minimal surveys being carried out to unearth faults or even collect people's views on the current services. The study also revealed that there were maintenance works being carried out on the sewer lines though only on faulty lines only and quality of service was rated as average. The study also established that on average, it would take 2 – 3 days to address a reported fault on a sewer line. This implied that the residents where the fault has been reported were exposed to a health risk.

The study also revealed that the employees of ELDOWAS had colleagues who had similar skills. This helped create cohesion and improve quality of work. However, it was established that technical employees were usually assigned jobs that did not match their

technical skills. This led to poor performance hence lowering quality. Recruitment was minimal and mostly done internally. Vacancies for jobs were advertised more on internal notice boards than public media. This also minimized the possibility of the getting the best employees in terms of skills and qualifications.

Evaluation was found to be carried out on the work carried out by employees to assess quality. However, the impact of evaluation was yet to be felt by the employees as well as the improvement of the quality of work. Individual job evaluation had minimal impact on the employee as only recognition was the only positive aspect that an employee would get.

5.3 Conclusion

The study concludes that population growth patterns have affected the management of sewerage facilities in Eldoret in that more challenges emerge on a daily basis and need to be handled tactfully. Management of ELDOWAS has been forced to make strategic plans that should accommodate an even higher population and new sites for putting up or expanding sewerage facilities have to be sought. The management of ELDOWAS has to plan for additional staff, especially once the Kipkenyo sewer facility will be complete and more awareness will be created. This may lead to an increased client base and therefore making prior plans to accommodate them will be imperative.

5.4 Recommendations

The study recommends the following:

That the managers of ELDOWAS should include projections of anticipated population changes based on the past data in their strategic plan to aid in planning for growth and expansion of the existing sewerage infrastructure.

That the management of ELDOWAS gradually makes an over haul of the existing infrastructure to a new and modern one so as to handle issues such as automatic notifications of faults hence improve efficiency and quality of service.

That the management of ELDOWAS should carry out regular surveys and identify weak point in their sewer system and make necessary changes to them before breaking down.

That the management of ELDOWAS should not only advertise for technical jobs internally or on unpopular media, but should advertise aggressively and recruit competitively so as to get most qualified and skilled personnel.

5.5 Suggestions for further reading

The study suggests the following areas for further research:

1. The influence of population growth on the managerial planning for service-oriented institutions
2. The role of organizational staff training on the performance of service-oriented organizations
3. The impact of population growth on evaluation on employee performance for quality
4. The impact of population growth on the management of personnel in service-oriented organizations

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APPENDICES

Appendix i: Questionnaire guide for junior/technical staff at ELDOWAS

Dear respondent,

You are kindly requested to fill the questionnaire below with utmost honesty. Information provided herein will not be used against you under whatsoever circumstances. Please do not provide any form of identity on this questionnaire. Thank you.

SECTION A: BACKGROUND INFORMATION				
1	Gender	Male Female	[] []	Select the most appropriate
2	Age bracket	18 – 20 21 – 25 26 – 30 >30	[] [] [] []	Select the most appropriate
3	How long have you been in this organization?	_____ (months or years)		State the length of time
4	Department where you work	_____		Fill in department
5	Position held	_____		Fill in position
6	Highest academic level attained	Primary O-Level Certificate Diploma Degree Masters PhD Any other	[] [] [] [] [] [] [] []	Select one
SECTION B: MANAGERIAL PLANNING				
1	Compare the number of people living in Eldoret 5years ago and now. What is your comment?	Significantly Increased Fairly Increased Increased Not increased Decreased Don't know	[] [] [] [] [] []	Select the most appropriate
2	Compare the number of clients using sewer services 5years ago	Significantly Increased Fairly Increased Increased	[] [] []	Select one

	and now. What is your comment?	Not increased Decreased Don't now	[] [] []	
3	How many sewer connections does your organization handle?			State
4	What is the capacity of the sewer plant you work in terms of households/connections?			State
5	Would you say the sewer capacity is exceeded, in your own observation and opinion?	Yes No	[] []	Select the most appropriate
6	Are there regions in Eldoret that have sewer lines but under used/tapped by residents of these regions?	Yes No	[] []	Select the most appropriate
7	If yes to Q5, are there marketing awareness events / activities carried out to promote your services in these regions?	Yes No	[] []	Select the most appropriate
8	Are there plans that are underway or have been put in place to counter your opinion in Q4, % and Q6 (if yes) above?	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>		

SECTION C: QUALITY OF SERVICE

1	Are there situations that sewer lines burst or block?	Yes No	[] []	Select one
2	If yes, How frequent does the sewer lines get blocked/burst?	Rarely Less frequently Frequently Every day	[] [] [] []	Select one
3	Are there automated services to notify you of leaks or blockages or bursts?	Yes No	[] []	Select one
4	How long does it take the concerned people to notify you of these leaks/blockages/bursts for you to go and attend to them?	Less than 1 hour 1-6hrs 7-12hrs 1 – 2days 3 – 5days More than 5 days	[] [] [] [] [] []	Select one
5	How long does it take you to plan and attend to the problem once informed?	Less than 1 hour 1-6hrs 7-12hrs 1 – 2days 3 – 5days	[] [] [] [] []	Select one

		More than 5 days	[]	
6	Are there any maintenance works carried out on the sewer line without necessarily bursting/blocking?	Yes No	[] []	Select one
7	If yes, what type of maintenance is carried out on the sewer line	1. Regular cleaning 2. Regular checks to identify leaks 3. Expansion of the sewer line 4. Replacement of worn out segments 5. Any other (List) _____ _____ _____	[] [] [] []	Select all that apply
8	Are there situations when your organization conducts surveys to get your views on how to improve service delivery?	Yes No	[] []	Select one
9	Generally, how would you rate the quality of service offered by your organization?	Excellent Good Average/Fair Bad Cant tell	[] [] [] [] []	Select one
SECTION D: MANAGERIAL STAFFING				
1	What are your areas of specialization?	_____ _____ _____		List all
3	Are there colleagues who have similar skills and qualifications as you?	Yes No	[] []	Select one
4	Are there technical jobs that you are asked to undertake but do not have related skills or expertise required?	Yes No	[] []	Select one
5	Are there regular recruitment excersises carried in your organization, either contract, 'piece-meal', casual or expatriate to handle 'excess work'?	Yes No	[] []	Select one
5	How do applicants learn of these opportunities?	Adverts (Print/TV/Radio) In house training Overseas scholarships Local technical institute Others: _____ _____ _____	[] [] [] []	Select/ specify all

SECTION E: MANAGERIAL EVALUATION PROCESS				
1	Does the organization have a customer care section/department?	Yes No	<input type="checkbox"/> <input type="checkbox"/>	Select one
2	If No to Q1, how does the organization collect customer queries and feedback?	_____ _____ _____		State
3	Does the organization keep records such as client queries, system routine check logs, maintenance, repairs etc?	Yes No	<input type="checkbox"/> <input type="checkbox"/>	Select one
4	Does management review these reports?	Yes No	<input type="checkbox"/> <input type="checkbox"/>	Select one
5	How frequently does review these reports?	Daily Weekly Monthly Quarterly Bi-annually Annually Others: _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select one/ State
6	Does management evaluate quality of work you do?	Yes No	<input type="checkbox"/> <input type="checkbox"/>	Select one
7	If No to Q6, who evaluates performance and work quality of employees?	_____ _____		State
8	What is the impact of job evaluation in your organization?	Promotion/Demotion Recognition Awards Salary increase Others: _____ _____ _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select all / State

Thank you participating in this study. God bless you.

Appendix ii: Questionnaire for managers and section heads of ELDOWAS

Dear respondent,

You are kindly requested to fill the questionnaire below with utmost honesty. Information provided herein will not be used against you or your organization under whatsoever circumstances. Please do not provide any form of identity on this questionnaire.

Thank you.

SECTION A: BACKGROUND INFORMATION				
1	Gender	Male Female	[] []	Select the most appropriate
2	Age bracket	Below 25 25– 30 31 – 35 36 – 40 >40	[] [] [] [] []	Select the most appropriate
3	How long have you been in this organization?	_____ (months / years)		State the length of time
4	Department/section you are in charge of	_____		Fill in department
5	Position held	_____		Fill in position
6	Highest academic level attained	Primary O-Level Certificate Diploma Degree Masters PhD Any other	[] [] [] [] [] [] [] []	Select one
SECTION B: MANAGERIAL PLANNING				
1	Compare the number of clients using sewer services 5years ago and now. What is your comment?	Significantly Increased Fairly Increased Increased Not increased Decreased Don't know	[] [] [] [] [] []	Select the most appropriate
2	How many sewer connections does your organization handle?	_____		Fill in

3	What is the capacity of the sewer plant you work in terms of households/connections?			Fill in
4	Would you say the sewer capacity is exceeded, in your own observation and opinion?	Yes No	[] []	Select the most appropriate
5	Are there regions in Eldoret that have sewer lines but under used/tapped by residents of these regions?	Yes No	[] []	Select the most appropriate
6	If yes to Q5, are there marketing awareness events / activities carried out to promote your services in these regions?	Yes No	[] []	Select the most appropriate
7	What plans are underway or have been put in place to counter your opinion in Q4, % and Q6 (if yes) above?	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>		
8	How do you envision your services in the next 10 years with regards to the achievement of Vision 2030?	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>		
SECTION C: QUALITY OF SERVICE				
1	Are there situations that sewer lines burst or block?	Yes No	[] []	Select one
2	If yes, How frequent does the sewer lines get blocked/burst?	Rarely Less frequently Frequently Every day	[] [] [] []	Select one
3	Are there automated services to notify you of leaks or blockages or bursts?	Yes No	[] []	Select one
4	How long does it take the concerned people to notify you of these leaks/blockages/bursts for you to go and attend to them?	Less than 1 hour 1-6hrs 7-12hrs 1 – 2days 3 – 5days More than 5 days	[] [] [] [] [] []	Select one
5	How long does it take you to plan and attend to the problem once informed?	Less than 1 hour 1-6hrs 7-12hrs 1 – 2days	[] [] [] []	Select one

		3 – 5days More than 5 days	[] []	
6	Are there any maintenance works carried out on the sewer line without necessarily bursting/blocking?	Yes No	[] []	Select one
7	If yes, what type of maintenance is carried out on the sewer line	6. Regular cleaning 7. Regular checks to identify leaks 8. Expansion of the sewer line 9. Replacement of worn out segments 10. Any other (List) _____ _____ _____	[] [] [] []	Select all that apply
8	Are there situations when your organization conducts surveys to get your views on how to improve service delivery?	Yes No	[] []	Select one
9	Are there other organizations, private or governmental, that collaborate with you?	Yes No	[] []	Select one
10	If yes to Q9, what is their role in terms of value addition?	Supervisory Monitor Quality Fund projects Managerial Provision of technical expertise Provision of training services Set standards Any other _____ _____ _____	[] [] [] [] [] [] []	Select/List all that apply
11	Generally, how would you rate the quality of service offered by your organization?	Excellent Good Average/Fair Bad Cant tell	[] [] [] [] []	Select one
SECTION D: MANAGERIAL STAFFING				
1	How many staff members are there in the section/department you head?	_____		Write
2	What are their areas of specialization?	_____ _____ _____		List all

3	Is the current number of staff able to handle the demand posed by the increasing population?	Yes No	[] []	Select one
4	Are there technical areas that are underserved in terms of availability of technical personnel?	Yes No	[] []	Select one
5	How and where do you source technical personnel from?	Adverts (Print/TV/Radio) In house training Overseas scholarships Local technical institute Others: _____ _____ _____	[] [] [] []	Select/ specify all
SECTION E: MANAGERIAL EVALUATION PROCESS				
1	Does the organization have a customer care section/department?	Yes No	[] []	Select one
2	If No to Q1, how does the organization collect customer queries and feedback?	_____ _____ _____		State
3	Does the organization keep records such as client queries, system routine check logs, maintenance, repairs etc?	Yes No	[] []	Select one
4	Does management review these reports?	Yes No	[] []	Select one
5	How frequently does review these reports?	Daily Weekly Monthly Quarterly Bi-annually Annually Others: _____	[] [] [] [] [] []	Select one/ State
6	Does management evaluate quality of work done by employees?	Yes No	[] []	Select one
7	If No to Q6, who evaluates performance and work quality of employees?	_____ _____		State

Thank you for participating in this study.

Appendix iii: Questionnaire for ELDOWAS Clients

Dear respondent,

You are kindly requested to fill the questionnaire below with utmost honesty. Information provided herein will not be used against you under whatsoever circumstances. Please do not provide any form of identity on this questionnaire. Thank you

Name of Region/Estate: _____

SECTION A: BACKGROUND INFORMATION				
1	Gender	Male Female	[] []	Select the most appropriate
2	Age bracket	18 – 20 21 – 25 26 – 30 >30	[] [] [] []	Select the most appropriate
3	How long have you been living in this town?	Born in Eldoret Less than 1 year 1-2 year 3-5years 6-10years Over 10years	[] [] [] [] [] []	Select one
4	Source of livelihood?	Business Employed Other	[] [] []	Select one
5	Highest academic level attained	Primary O-Level Certificate Diploma Degree Masters PhD Any other	[] [] [] [] [] [] [] []	Select one
6	Is there a sewer line within the Estate where you live?	Yes No Don't Know	[] [] []	Select one
7	Is there a water line within the Estate where you live?	Yes No Don't Know	[] [] []	Select one
8	How would you rate the number of clients consuming ELDOWAS services?	High Average Low	[] [] []	Select one

SECTION B: CHANGES IN NUMBER OF CLIENTS USING SEWER SERVICES				
1	Do you live in your own premise or rented?	Own Rented	<input type="checkbox"/> <input type="checkbox"/>	Select one
2	Do you have a sewer line connection to your place of residence?	Yes No	<input type="checkbox"/> <input type="checkbox"/>	Select one
3	For how long have you been using the sewer services?	Less than 1 year 1-2 year 3-5years 6-10years Over 10years	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select one
4	How would compare the number of people living in Eldoret 5 years ago and today?	1. There has been a significant increase 2. There is an increase though not significant 3. There is no change	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select the most appropriate
5	How would you compare the number of sewer connections to residents 5years ago and today?	1. There has been a significant increase 2. There is an increase though not significant 3. There is no change	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select the most appropriate
SECTION C: EVALUATION OF SEWERAGE SERVICES BY ELDOWAS				
1	How would compare the services of ELDOWAS to other services?	Excellent Better Good Fair Bad Worst	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select one
2	How frequently do you receive ELDOWAS staff examining the sewer lines?	Rarely Less frequently Frequently Every day When need arises	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select one
3	How frequently do the Sewerage charges change?	Rarely Less frequently Frequently Every day When need arises	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select one
4	How frequently does ELDOWAS collect information regarding your changing needs on the sewerage services?	Rarely Less frequently Frequently Every day When need arises	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select one
5	How do you communicate to ELDOWAS	_____		State

SECTION D: QUALITY OF SERVICE OFFERED BY ELDOWAS				
1	Are there situations that your sewer line blocks/burst?	Yes No	[] []	Select one
2	If yes, how long did the concerned people take to unblock/repair the sewer line?	Less than 1 hour 1-6hrs 7-12hrs 1 – 2days 3 – 5days More than 5 days	[] [] [] [] [] []	Select one
3	How frequent does the sewer lines get blocked/burst?	Rarely Less frequently Frequently Every day When need arises	[] [] [] [] []	Select one
4	Are there any maintenance works carried out on the sewer line without necessarily bursting/blocking?	Yes No	[] []	Select one
5	If yes, what type of maintenance is carried out on the sewer line	11. Regular cleaning 12. Regular checks to identify leaks 13. Expansion of the sewer line 14. Replacement of worn out segments 15. Any other (List) _____ _____ _____	[] [] [] []	Select all that apply
6	Are there situations when ELDOWAS conducts surveys to get your views on service delivery?	Yes No	[] []	Select one
7	Generally, how would you rate the quality of service offered by ELDOWAS?	Excellent Good Average/Fair Bad Cant tell	[] [] [] [] []	Select one

**IGA: Income Generating Activity*

Thank you for participating in this study

Appendix iv: Interview Schedule for managers of ELDOWAS

Dear respondent,

This interview guide seeks your opinion on the impact of teamwork on the achievement of organizational tasks in your organizations. Your willing participation is highly appreciated and your responses will be kept confidential. Thank you.

Questions

1. What position do you hold in ELDOWAS?
2. How many clients do you suppose use your sewer services?
3. How would you compare the number of clients using the sewer services 5 years ago and today?
4. How do clients contact or communicate to the organization when in need of information?
5. How frequently do you receive notifications about blockages or burst/leaking sewer lines?
6. Would you say that the emergency technical team is adequate to handle all reported cases?
7. How do you recruit technical personnel into the organization?
8. Compare the number of technical staff you had 5 years ago and today. Would you say the number has increased and for what reason?
9. According to you, are there leaking/burst sewer lines that are yet to receive attention from your team?
10. If yes, what is the reason for not having attended to these leaking/burst lines?
11. Would you say that the current facility is able to handle the needs and requirements of the population?
12. Are there plans to expand the current facility so as to handle and effectively treat more waste?
13. How frequently do you carry out reviews on the plant processes for improvement?
14. Given the changes in the number of clients using sewer services, are there plans underway to handle the increased demand for this service?

Appendix v: Interview Schedule for Section/Departmental heads at ELDOWAS

Dear respondent,

This interview guide seeks your opinion on the impact of teamwork on the achievement of organizational tasks in your organizations. Your willing participation is highly appreciated and your responses will be kept confidential. Thank you.

Questions

1. What department/section do you head in ELDOWAS?
2. How many clients do you suppose use your sewer services?
3. How many employees do you manage in your department?
4. How would you compare the number of clients using the sewer services 5 years ago and today?
5. How frequently do you receive notifications about blockages or burst/leaking sewer lines?
6. Would you say that the emergency technical team is adequate to handle all reported cases?
7. How do you recruit technical personnel into the organization?
8. Compare the number of technical staff you had 5 years ago and today. Would you say the number has increased and for what reason?
9. According to you, are there leaking/burst sewer lines that are yet to receive attention from your team?
10. If yes, what is the reason for not having attended to these leaking/burst lines?
11. Would you say that the current facility is able to handle the needs and requirements of the population?
12. How frequently do you carry out reviews on the plant processes for improvement?
13. Given the changes in the number of clients using sewer services, are there plans underway to handle the increased demand for this service?